## REMARKS

### I. Introduction

Claims 8-15 are currently pending. Independent claims 8, 13, 14 and 15 have been amended, support for which is found throughout the specification, for example, in paragraph [0035] of the originally filed specification. No new matter has been added.

In view of the foregoing amendments and the following remarks, Applicants respectfully submit that the claims are allowable and the application is in condition for allowance.

### II. Claim Rejections Under 35 U.S.C. § 103(a)

**Mohanty or Ohme, in combination with either Fumitomo or Gilman and Lee**

Claims 8-10 and 13-15 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over either Mohanty (U.S. 2003/0216496 ) or Ohme (U.S. 2004/024803), in combination with either Fumitomo (JP2002-241566) or Gilman (Fire retardant additives for polymeric materials 1. Char formation from silica gel-potassium carbonate. Thirteenth meeting of the UJNR panel of fire research and safety, March 13-20, 1996, vol. 2) and further in view of Lee et al., (U.S. 6,337,363).

Applicants respectfully disagree.

However, in an effort to expedite prosecution, claims 8, 13, 14 and 15 have been amended and now recite, in pertinent part, "**wherein said inorganic porous material on which flame retardancy-imparting component is supported is solid and particulate before it is dispersed in said resin composition.**"

As explained in the specification, in paragraph [0035], the dry and **solid** flame retardancy-imparting component supported **on the inorganic porous material particulate is**

**crushed into nano-scale particulate and evenly dispersed in the resin composition** by a shear force applied upon kneading the resin component and the supported flame retardancy-imparting component.

In other words, the improvement in flame retardancy is conferred, in part by the fact that the supported flame retardancy-imparting component is dry and solid. If the inorganic porous material with the flame retardancy-imparting component supported thereon contained a solvent, the thermoplastic plastic product would not be manufactured well since the solvent reduces the viscosity of the thermoplastic plastic resin. Further, it would be necessary to evaporate the solvent during the manufacturing process, which complicates the process. In addition, if the solvent is not evaporated fully, the resultant thermoplastic product would have lower quality. Thus, the resin recited in the instant claims is advantageous in that it can be produced by a simple process **without evaporating the solvent**.

The Examiner on page 5 of the Final Office Action mailed June 18, 2009 concedes that none of Mohanty or Ohme, in combination with either Fumitomo or Gilman teach that the flame retardant is supported ***before*** mixing with the polymer, and therefore relies on Lee for this alleged disclosure.

On page 9 of the Final Office Action mailed June 18, 2009, the Examiner contends that "Lee applies in the Rejection as a secondary reference in order to demonstrate that premixing of Silica and a flame retardant is known in Prior Art.

However, It is well settled that, "[a] reference should be considered as a whole, and portions arguing against or teaching away from the claimed invention must be considered." *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.* 796 F.2d 443, 230 USPQ 416 (Fed. Cir. 1986). Moreover, a reference *teaches away* when it "would likely discourage the art worker

from attempting the substitution suggested by [the inventor/patentee]." *Gillette Co. v. S.C. Johnson & Son, Inc.*, 919 F.2d 720, 16 USPQ2d 1923 (Fed. Cir. 1990).

Importantly, Lee teaches that the *resin composition is diluted with suitable organic solvent, followed by coating and subsequent heating*, (see, column 3, line 45). As such, Lee, does not teach the **solid and particulate** silica porous material with the flame retardancy-imparting component supported thereon, as recited in amended claims 8, 13, 14 and 15. Rather, in the resin composition of Lee, the flame retardant is contained as "a silica-novolac hybrid resin *solution*" (see, col. 1, lines 60-61). This silica-novolac hybrid resin solution is a reaction product obtained by a sol-gel reaction between an organosilane and a phenolic novolac resin (see, col. 1, lines 62-65). Moreover, hydrochloric acid, sulfuric acid, acetic acid, or ammonium hydroxide, in **liquid form** are used in the reaction, (see, col. 3, lines 16-23). Since the preparation of the silica-novolac hybrid resin solution involves the *reaction*, it would cause chemical specific bonding between the organosilane and the phenolic novolac resin and the solution, which is **different** from the inorganic porous material with the flame retardancy-imparting component physically supported thereon.

Further, Lee describes that the epoxy resin composition is diluted with a suitable organic solvent to prepare varnish (see, col.3, lines 43-44).

The Examiner's attention is directed to col. 3, lines 45-48 in Lee, which specifies a method for producing a **"prepreg"** wherein a glass substrate is coated or impregnated with the varnish. In other words, Lee does not teach nor suggest that the **particulate and solid inorganic porous material with flame retardancy-imparting component supported thereon is prepared before it is mixed with the resin component to be flame-retarded.**

Moreover, neither Mohanty nor Ohme teach or suggest that the flame retardancy-imparting component is supported on an inorganic porous material before it is dispersed in the resin composition. Thus, these documents do not teach nor suggest that such a supported flame retardancy-imparting component improves the dispersion of it in the resin composition preventing the aggregation of the flame retardancy-imparting component. The aggregation of small particles generally requires more flame-retardancy imparting component to achieve the desired flame retardancy.

Furthermore, Applicants respectfully submit that, even if Lee is combined as a secondary reference, neither Lee, nor the other cited prior art documents teach or suggest that "the inorganic porous material on which flame retardancy-imparting component is supported is solid and particulate before it is dispersed in said resin composition."

In contrast, the subject matter recited in claims 8, 13, 14 and 15 makes it possible to achieve the desired flame retardancy with a small amount of the flame retardancy-imparting component, since the aggregation is effectively prevented by using the inorganic porous material which has a large dimension at the beginning of mixing and is crushed into nano-scale particulate during mixing (see the paragraphs [0033] of the originally filed specification).

Therefore, it is clear that none of the cited prior art references, either alone or in combination, teach or suggest all of the elements of claim 8, 13, 14 and 15.

Accordingly, it is respectfully submitted that, claims 8, 13, 14 and 15 are allowable. Furthermore, claims 9-12 depend from and further define the subject matter of claim 8 and therefore are also allowable.

**Mohanty or Ohme, in combination with either Fumitomo or Gilman and further in view of Dorfman and Lee**

Claims 11 and 12 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over either Mohanty or Ohme, in combination with either Fumitomo or Gilman and further in view of Dorfman (U.S. 3,983,185) and Lee. Applicants respectfully disagree with this rejection.

However, as discussed above, in an effort to expedite prosecution, claims 8, 13, 14 and 15 have been amended to recite, "wherein said inorganic porous material on which flame retardancy-imparting component is supported is solid and particulate before it is dispersed in said resin composition."

As discussed above, in reference to the rejection of claims 8-10 and 13-15 under 35 U.S.C. § 103(a), none of Mohanty, Ohme, Fumitomo, Gilman or Lee teach or suggest that the **inorganic porous material on which flame retardancy-imparting component is supported is solid and particulate before it is dispersed in said resin composition**, as recited in amended claims 8, 13, 14 and 15.

Moreover, the addition of Dorfman to the combination of references does not ameliorate this deficiency in the cited prior art references because, at a minimum, Dorfman also does not teach or suggest a composition in which the **inorganic porous material on which flame retardancy-imparting component is supported is solid and particulate before it is dispersed in said resin composition.**

Thus, it is clear that none of the cited prior art references teach or suggest all of the elements of amended claims 8, 13, 14 and 15.

Accordingly, it is respectfully submitted that claims 8, 13, 14 and 15 are allowable over the cited prior art references. Furthermore, claims 11 and 12 depend from and further define the subject matter of claim 8 and therefore should also be allowed.

In view of the above amendments and remarks, Applicants respectfully submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

Michael E. Fogarty
Registration No. 36,139

**Please recognize our Customer No. 53080 as our correspondence address.**

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 MEF:ASA
Facsimile: 202.756.8087
**Date: September 14, 2009**